



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

August 11, 2015

Mr. Joseph W. Shea  
Vice President, Nuclear Licensing  
Tennessee Valley Authority  
1101 Market Street, LP 3R-C  
Chattanooga, TN 37402-2801

**SUBJECT: SEQUOYAH NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT  
05000327/2015002 AND 05000328/2015002**

Dear Mr. Shea:

On June 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Sequoyah Nuclear Plant, Units 1 and 2. On June 29, 2015, the NRC inspectors discussed the results of this inspection with Mr. J. Carlin and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

One self-revealing finding of very low safety significance (Green) was identified during this inspection. This finding was determined to involve violations of NRC requirements. Further, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Sequoyah Nuclear Plant.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of

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the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

***/RA/***

Alan J. Blamey, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Docket Nos.: 50-327, 50-328  
License Nos.: DPR-77, DPR-79

Enclosure: Inspection Report 05000327/2015002, 05000328/2015002  
w/Attachment: Supplementary Information

cc: Distribution via ListServ

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Letter to Joseph W. Shea from Alan J. Blamey dated August 11, 2015

SUBJECT: SEQUOYAH NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT  
05000327/2015002 AND 05000328/2015002

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**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 50-327, 50-328

License Nos.: DPR-77, DPR-79

Report Nos.: 05000327/2015002, 05000328/2015002

Licensee: Tennessee Valley Authority (TVA)

Facility: Sequoyah Nuclear Plant, Units 1 and 2

Location: Sequoyah Access Road  
Soddy-Daisy, TN 37379

Dates: April 1 – June 30, 2015

Inspectors: G. Smith, Senior Resident Inspector  
W. Deschaine, Resident Inspector  
A. Butcavage, Reactor Inspector  
R. Carrion, Senior Reactor Inspector  
M. Coursey, Reactor Inspector

Approved by: Alan Blamey, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000327/2015002, 05000328/2015002; 4/1-6/30/2015; Sequoyah Nuclear Plant, Units 1 and 2; Routine Integrated Report Sequoyah Nuclear Plant, Units 1 and 2; Operability Determinations and Functionality Assessments

The report covered a three-month period of inspection by resident inspectors and regional inspectors. There was one violation and associated finding documented in this report. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP) dated April 29, 2015. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

### A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

Green. A self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," was identified for the licensee's failure to follow a foreign material exclusion procedure and precluded foreign material from entering the safety-related Essential Raw Cooling Water (ERCW) system. This resulted in wood debris within the ERCW that ultimately migrated to the 2B2 emergency diesel heat exchanger. Immediate corrective actions included removal of the foreign material and the performance of an engineering analysis to ensure the wood debris did not affect the system operability. The licensee placed this issue into their corrective action program as CR 1033792.

The performance deficiency was determined to be more than minor because it was associated with the human performance attribute of the mitigating systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the performance deficiency allowed a piece of wood to enter into the 2B2 emergency diesel heat exchanger blocking 11 tubes. Because the finding was a deficiency affecting the design of a mitigating structure, systems, or components (SSCs) that was confirmed not to have resulted in the loss of operability, it was determined to be of very low safety significance (Green). The inspectors determined that no cross-cutting aspect will be assigned to this performance deficiency since it occurred in 2008 and is therefore not indicative of current licensee performance. (Section 1R15)

### B. Licensee-Identified Violations

A violation of very low safety significance which was identified by the licensee was reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program (CAP). That violation and corrective action tracking number are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status:

Unit 1 began the inspection period at 75 percent rated thermal power (RTP) due to an end-of-life (EOL) coast-down as well as other EOL considerations such as maintenance of adequate axial flux difference, de-borating ion exchanger status, etc. Unit 1 continued to operate at 75 percent RTP until April 11 when the unit was shut down for a refueling outage. Unit 1 returned to 100 percent RTP on May 21, where it operated for the remainder of the inspection period.

Unit 2 operated at or near 100 percent RTP for the entire inspection period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R04 Equipment Alignment (71111.04)

##### .1 Partial System Walkdown

###### a. Inspection Scope

The inspectors performed partial walkdowns of the following four systems to verify the operability of redundant or diverse trains and components when safety equipment was inoperable. The inspectors focused on identification of discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, walked down control system components, and determined whether selected breakers, valves, and support equipment were in the correct position to support system operation. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP. Documents reviewed are listed in the Attachment. The inspectors completed four samples. This activity constituted four Equipment Alignment Partial System Walkdown samples.

- B-train auxiliary building gas treatment system due to planned maintenance on Unit 1 'A' 669' Penetration Room Cooler
- Spent Fuel Pool Cooling after core offload during U1R20
- 1A motor driven auxiliary feed-water (AFW) train while the 1B AFW pump was out of service for planned maintenance
- 1B emergency diesel generator (EDG) while 1A EDG was out of service for planned maintenance

###### b. Findings

No findings were identified.

## .2 Complete System Walkdown

### a. Inspection Scope

The inspectors performed a complete system walkdown of the Residual Heat Removal system and support systems to verify proper equipment alignment, to identify any discrepancies that could impact the function of the system and increase risk, and to verify that the licensee properly identified and resolved equipment alignment problems that could cause events or impact the functional capability of the system.

The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), system procedures, system drawings, and system design documents to determine the correct lineup and then examined system components and their configuration to identify any discrepancies between the existing system equipment lineup and the correct lineup. During the walkdown, the inspectors reviewed the following:

- Valves were correctly positioned and did not exhibit leakage that would impact the functions of any given valve.
- Electrical power was available as required.
- Major system components were correctly labeled, lubricated, cooled, ventilated, etc.
- Hangers and supports were correctly installed and functional.
- Essential support systems were operational.
- Ancillary equipment or debris did not interfere with system performance.
- Tagging clearances were appropriate.
- Valves were locked as required by the locked valve program.

In addition, the inspectors reviewed outstanding maintenance work requests and design issues on the system to determine whether any condition described in those work requests could adversely impact current system operability. Documents reviewed are listed in the Attachment to this report. This activity constitutes one Equipment Alignment Complete System Walkdown sample.

### b. Findings

No findings were identified.

## 1R05 Fire Protection (71111.05)

### .1 Fire Protection Tours

#### a. Inspection Scope

The inspectors conducted a tour of the four areas important to safety listed below to assess the material condition and operational status of fire protection features. The inspectors evaluated whether: combustibles and ignition sources were controlled in accordance with the licensee's administrative procedures; fire detection and suppression equipment was available for use; passive fire barriers were maintained in good material



condition; and compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with the licensee's fire plan. Documents reviewed are listed in the Attachment. This activity constitutes four Fire Protection Tour samples.

- Unit 1 Lower containment
- Unit 1 Upper containment
- Unit 1 Annulus
- Control Building Elevation 745

b. Findings

No findings were identified.

.2 Annual Drill Observations

a. Inspection Scope

On May 27, 2015, the inspectors observed an announced fire drill in the Offices and Power Stores Air Handling Unit Vault. The inspectors assessed fire alarm effectiveness; response time for notifying and assembling the fire brigade; the selection, placement, and use of firefighting equipment; use of personnel fire protective clothing and equipment (e.g., turnout gear, self-contained breathing apparatus); communications; incident command and control; teamwork; and firefighting strategies. The inspectors also attended the post-drill critique to assess the licensee's ability to review fire brigade performance and identify areas for improvement. Following the critique, the inspectors compared their findings with the licensee's observations and to the requirements specified in the licensee's Fire Protection report. This activity constitutes one Fire Protection Annual Drill Observation sample.

b. Findings

No findings were identified.

1R08 In-service Inspection Activities (71111.08)

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities

From April 20 - 24, 2015, the inspectors conducted an onsite review of the implementation of the licensee's inservice inspection (ISI) program for monitoring degradation of the reactor coolant system boundary, risk-significant piping and component boundaries, and containment boundaries in Unit 1.

The inspectors either directly observed or reviewed the following non-destructive examinations (NDEs), mandated by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code of Record: 2001 Edition with 2003

Addenda), to evaluate compliance with the ASME Code, Section XI and Section V requirements, and if any indications or defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code or an NRC-approved alternative requirement or current relief requests. The inspectors also reviewed the qualifications of the NDE technicians performing the examinations, to determine whether they were current and in compliance with the ASME Code requirements.

- Penetrant Test (PT), 1-SIS-0448-C-11, Integral Attachment Weld, ASME Code Class 2 (reviewed)
- Visual Examination (VT), 1-AFDH-361, Component Support, ASME Code Class 2 (observed)
- Magnetic Particle Test (MT), 1-FDH-361-IA, Integral Attachment Weld, ASME Code Class 2 (reviewed)
- MT, 1-FDH-310-IA, Integral Attachment Weld, ASME Code Class 2 (reviewed)

The inspectors reviewed the following welding activity, qualification records, and associated documents in order to evaluate compliance with procedures and the ASME Code Section IX requirements. Specifically, the inspectors reviewed a sample of the work order, repair and replacement plan, weld data sheets, welding procedures, procedure qualification records, welder performance qualification records, and NDE reports.

- Work Order 116319444, Containment Spray Heat Exchanger 1-A, Weld 1-CS-31, ASME Code Class 2

The inspectors reviewed the following surface examination records with recordable indications that were analytically evaluated and accepted for continued service, to determine if the disposition was in accordance with the ASME Code, Section XI requirements or an NRC-approved alternative.

- PT Surface Examination, I-SIH-242-IA, Integral Attachment Weld, ASME Code Class 2

#### Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities

The inspectors verified that the required Unit 1 vessel head volumetric examination of the control rod drive mechanism (CRDM) penetrations was conducted during this outage, in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D). The inspectors also reviewed the calculation of effective degradation years (EDY), the previous examination history, and verified that a VT of the upper reactor vessel closure head (RVCH) outer surface as required by Code Case N-729-1, was not required during this outage.

The inspectors reviewed the NDE activities for the volumetric examination of selected reactor vessel upper head penetrations to determine if the activities, including the disposition of indications and defects, were conducted in accordance with the requirements of ASME Code Case N-729-1, as incorporated by reference in 10 CFR 50.55a(g)(6)(ii)(D). In addition, the inspectors' review also determined whether

essentially 100 percent of the required examination volumes were examined, and whether a volumetric or surface leakage path examination was completed.

The inspectors' review of the NDE of RVCH penetration nozzles included independent observation and evaluation of ultrasonic (UT) examinations (for both data acquisition and analysis), review of NDE procedures, personnel qualifications and training, and NDE equipment certifications. The inspectors also held interviews with contractor representatives and licensee personnel involved with the RVCH examination. The activities were reviewed to verify licensee compliance with the *Code of Federal Regulations*. The inspectors reviewed a sample of the results from the volumetric UT examinations of RVCH penetration nozzles. Specifically, the inspectors reviewed or observed the following:

- Observed portions of in-process UT data acquisition scanning of RVCH penetration nozzles 45 and 57.
- Reviewed the UT electronic data with the Level III analyst for RPVH nozzles 24, 51, and 74. Nozzles reviewed were CRDM penetrations in which potential indications were identified for additional review.
- Reviewed the RVCH susceptibility ranking and calculation of EDY.

The licensee did not identify any relevant indications that were accepted for continued service. In addition, the licensee had not performed any welding repairs to the vessel head penetrations since the beginning of the last Unit 1 refueling outage; therefore, no NRC review was completed for these inspection procedure attributes.

#### Boric Acid Corrosion Control Inspection Activities

The inspectors reviewed the licensee's boric acid corrosion control (BACC) program activities to determine if the activities were implemented in accordance with the commitments made in response to NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," and applicable industry guidance documents. Specifically, the inspectors performed an onsite records review of procedures, and the results of the licensee's containment walkdown inspections performed during the current refueling outage. The inspectors also interviewed the BACC program owner, conducted an independent walkdown of containment to evaluate compliance with licensee's BACC program requirements, and verified that degraded or non-conforming conditions such as boric acid leaks, were properly identified and corrected in accordance with the licensee's BACC and CAP.

The inspectors reviewed the following engineering evaluations, completed for evidence of boric acid leakage, to determine if the licensee properly applied applicable corrosion rates to the affected components; and properly assessed the effects of corrosion-induced wastage on structural or pressure boundary integrity in accordance with the licensee procedures.

- Boric Acid Evaluation (BAE) for Problem Evaluation Report (PER) 551465, Component SQN-1-VLV-074-0521, Residual Heat Removal Pump 1B-B

- BAE for PER 959514, Component SQN-1-PMP-063-0015, SIS Pump 1B-B
- BAE for PER 522341, Component SQN-1-VLV-062-0714, Letdown Isolation Test Valve

The inspectors reviewed the following service requests (SRs) and associated borated water leak assessments related to evidence of boric acid leakage, to evaluate if the corrective actions were consistent with the requirements of the ASME Code; 10 CFR Part 50, Appendix B, Criterion XVI; and industry guidance.

- SR 998034, Component SQN-1-VTIV-068-0414E, High Side Vent Valve to FT-69-29B
- SR 9979 20, Component SQN-1-FCV-062-0053, No.1 Seal Bypass Flow Control Valve
- SR 997924, Component SQN-1-MVOP-063-0111, SIS Check Valve Leak Test Isolation Valve

#### Steam Generator Tube Inspection Activities

The inspectors verified that for the Unit 1 steam generators tubes, no inspection activities were required this refueling outage, in accordance with the requirements of the ASME Code, the licensee's Technical Specifications, and Nuclear Energy Institute 97-06, "Steam Generator Program Guidelines."

#### Identification and Resolution of Problems

The inspectors reviewed a sample of ISI-related issues entered into the CAP to determine if the licensee had appropriately described the scope of the problem, and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements.

#### Loose Parts Condition Caused by Two Spilled Specimen Capsules

The inspectors performed a review of the licensee's Foreign Object Search and Retrieval (FOSAR) efforts for the specimen capsules and parts dropped into the Reactor Vessel during the 1R20 refueling outage. The review consisted of reviewing the video provided by the licensee during the FOSAR of the reactor vessel, lower core plate, diffuser plate, lower support casting, secondary core support structure, and the equipment pit which includes the cavity floor and transfer canal. Additionally, the inspectors reviewed the results of the licensee's 10-year reactor vessel internals ISI visual inspection and supplemental inspections conducted by reactor engineering during the 1R20 refueling outage for indications of degradation. There were no relevant indications detected in accordance with ASME Code Section XI criteria. Additionally, the inspectors reviewed the contractor Loose Parts Evaluation of Debris at SEQ1-21 Redesign.

The documents reviewed are listed in the Attachment. This activity constituted one In-service Inspection Activity sample.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

.1 Quarterly Review

a. Inspection Scope

On June 26, 2015, the inspectors observed an evaluated simulator scenario administered to an operating crew conducted in accordance with the licensee's accredited requalification training program. The scenario evaluated the operators' ability to respond to a main generator trip with a loss of secondary heat sink.

The inspectors assessed the following:

- licensed operator performance
- the ability of the licensee to administer the scenario and evaluate the operators
- the quality of the post-scenario critique
- simulator performance

Documents reviewed are listed in the attachment. This activity constituted one Licensed Operator Regualification Quarterly Review inspection sample.

b. Findings

No findings were identified

.2 Quarterly Review of Licensed Operator Performance

a. Inspection Scope

The inspectors observed licensed operator performance in the main control room during the Unit 1 reactor startup from refueling outage cycle 20.

The inspectors assessed the following:

- use of plant procedures
- control board manipulations
- communications between crew members
- use and interpretation of instruments, indications, and alarms
- use of human error prevention techniques
- documentation of activities
- management and supervision

Documents reviewed are listed in the Attachment. This activity constituted one Licensed Operator Performance inspection sample.

b. Findings

No findings were identified

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed the maintenance activities, issues, and/or systems listed below to verify the effectiveness of the licensee's activities in terms of: appropriate work practices; identifying and addressing common cause failures; scoping in accordance with 10 CFR 50.65(b); characterizing reliability issues for performance; trending key parameters for condition monitoring; charging unavailability for performance; classification in accordance with 10 CFR 50.65(a)(1) or (a)(2); appropriateness of performance criteria for SSCs and functions classified as (a)(2); and appropriateness of goals and corrective actions for SSCs and functions classified as (a)(1). Documents reviewed are listed in the Attachment. This activity constitutes two Maintenance Effectiveness samples.

- Cause Determination Evaluation (CDE) 2816 – Maintenance rule functional failure of the 'A' main control room air handler unit
- CDE 2819 – Shut down board room chiller failure

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed the following activities to determine whether appropriate risk assessments were performed prior to removing equipment from service for maintenance. The inspectors evaluated whether risk assessments were performed as required by 10 CFR 50.65(a)(4), and were accurate and complete. When emergent work was performed, the inspectors reviewed whether plant risk was promptly reassessed and managed. The inspectors also assessed whether the licensee's risk assessment tool use and risk categories were in accordance with Standard Programs and Processes Procedure NPG-SPP-07.1, "On-Line Work Management," Revision 16. Documents reviewed are listed in the Attachment. This activity constitutes five Maintenance Risk Assessments and Emergent Work Control samples.

- 2A EDG emergent failure of electric governor
- Long term failure of 2-IV battery charger
- Review of Unit 1 Refueling Outage schedule

- Two hour shut-down LCO to install a temporary modification on IV battery
- 2A EDG emergent failure of the voltage overshoot reduction device (VORD)

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

For the five operability evaluations described in the condition reports (CRs) listed below, the inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification (TS) operability was properly justified and the subject component or system remained available, such that no unrecognized increase in risk occurred. The inspectors compared the operability evaluations to UFSAR descriptions to determine if the system or component's intended function(s) were adversely impacted. In addition, the inspectors reviewed compensatory measures implemented to determine whether the compensatory measures worked as stated and the measures were adequately controlled. The inspectors also sampled CRs to assess whether the licensee was identifying and correcting deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment. This activity constitutes five Operability Determination and Functionality Assessment samples.

- CR 922169 ODMI U1R20 Reactor Cavity Leakage
- CR 1004562, Intermediate Range N-35 and N-36 incorrect setpoints
- CR 992513, Gas vented during performance of emergency core cooling system (ECCS) piping vents
- CR 1024123, 1B-B DG frequency outside administrative limit
- CR 1033792, Wood fragments discovered in 2B1/2B2 Diesel Heat Exchangers

b. Findings

Introduction: A Green self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," was identified for the licensee's failure to follow SPP-6.5, "Foreign Material Control" procedure for the ERCW system. This resulted in foreign material blocking flow through 11 tubes of the 2B2 emergency diesel heat exchanger.

Description: On June 1, 2015, during the Generic Letter (GL) 89-13 inspection of the 2B1 and 2B2 emergency diesel heat exchangers under Preventative Maintenance (PM) 041542000 and 041552000 respectfully, the licensee discovered four wood fragments blocking 11 tubes in the 2B2 emergency diesel heat exchanger. The total number of acceptable blocked tubes is 0 per calculation MDQ00006720030142, "Emergency Diesel Generator (EDG) ERCW Heat Exchanger Evaluation for 87F," Revision 3. The fragments of wood were removed and the tubes cleaned prior to returning the heat exchanger to service. The licensee entered this issue into their corrective action program as CR 1033792. The licensee did an evaluation to determine if the 2B-B emergency

diesel had ever been inoperable since the last heat exchanger inspection, which occurred on August 8, 2013. With the 11 tubes plugged the evaluation resulted in the river temperature being limited to 85F, from a normal design value of 87F. The licensee then did a review of historical river temperatures since August 8, 2013, and found the highest temperature was 84.2F which occurred on September 3, 2014. The licensee determined that because the river temperature never went above 85F that the 2B-B emergency diesel generator was always operable, even though there was a reduction in margin. The inspectors conducted an independent review of the licensee's evaluation and determined that they were adequate.

SPP-6.5, "Foreign Material Control" requires that for level 1 and 2 Foreign Material Exclusion (FME) zones, the licensee ensures any foreign material from the component or system that is breached will be removed before final closure.

Analysis: The licensee's failure to adequately follow their Foreign Material Control procedure was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the human performance attribute of the mitigating systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, failing to adequately follow the Foreign Material Control procedure while conducting the internal inspection and cleaning of the 1B-B ERCW strainer under WO 2004-772095-000 allowed a piece of wood to enter into the 2B2 emergency diesel heat exchanger blocking 11 tubes. The licensee determined that because the river temperature never went above 85F the 2B-B emergency diesel generator was always operable, even though there was a reduction in margin. Using Manual Chapter 0609, Attachment 4 - Initial Characterization of Findings, and Appendix A - The Significance Determination Process for Findings at Power, the finding was screened against the mitigating systems cornerstone and determined to be of very low safety significance (Green) because the finding was a deficiency affecting the design of a SSC, confirmed not to have resulted in the loss of operability. The inspectors determined that no cross cutting aspect will be assigned to this performance deficiency since it occurred in 2008 and is not indicative of current plant performance.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality be prescribed by documented procedures of a type appropriate to the circumstance and be accomplished in accordance with these procedures. The licensee established procedure SPP-6.5, "Foreign Material Control," Revision 13, as the implementing procedure to prevent the uncontrolled introduction of foreign material into open systems or components. Procedure SPP-6.5, Appendix D, Step 5 stated in part, "The Work Supervisor or Designee shall verify that all foreign material has been removed from the system or component opening just before final closure." Contrary to the above, before December 18, 2008, the licensee failed to adequately verify that all foreign material had been removed from the 1B-B ERCW strainer just before final closure while conducting work under WO 2004-772095-000.



This allowed foreign material to enter the ERCW system and transport to the 2B2 emergency diesel heat exchanger blocking 11 tubes. Because the finding was of very low safety significance and has been entered into the licensee's CAP as CR 1033792, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000328/2015002-01, "Failure to adequately follow foreign material control procedures.")

1R18 Plant Modifications (71111.18)

Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below and the associated 10 CFR 50.59 screening, and compared it against the UFSAR and TS to verify whether the modification affected operability or availability of the affected system.

- SQN-0-2015-250-001, Provide Temp power from 1-S Charger to 125 vital boards III and IV
- SQN-0-2015-082-001, Functionally disabling VORD and direct current (DC) amp meter on 2A EDG

Following installation and testing, the inspectors observed indications affected by the modification, discussed them with operators, and verified that the modification was installed properly and its operation did not adversely affect safety system functions. Documents reviewed are listed in the Attachment. This activity constitutes two Temporary Modification samples.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests associated with the five WOs listed below to assess whether procedures and test activities ensured system operability and functional capability. The inspectors reviewed the licensee's test procedure to evaluate whether: the procedure adequately tested the safety function(s) that may have been affected by the maintenance activity; the acceptance criteria in the procedure were consistent with information in the applicable licensing basis and/or design basis documents; and the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed the test data to determine whether test results adequately demonstrated restoration of the affected safety function(s). Documents reviewed are listed in the Attachment. This constituted five Post-Maintenance Testing samples.

- WO 116740563, Replace the 2A-A EDG electric governor controller (2301A)

- WO115144061, Implement DCN 23216, Stage 8. Remove the auto function from 2-HS-3-128C-B
- WO 116109358, Perform 0-MI-EPM-317-040.0 for the arrowhead contactor
- WO 116256562, Preventive maintenance for Train B Reactor Vessel Level Indicating System transmitters panel isolation valves
- WO 115622809, Determinate/reterminate the cooler fan motor to facilitate coil replacement on WO 114850708

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

For the Unit 1 refueling outage from April 11, 2015 through May 20, 2015, the inspectors evaluated the following outage activities:

- outage planning
- portions of the cooldown process, refueling, plant heatup, and reactor startup
- reactor coolant system instrumentation and electrical power configuration
- reactivity and inventory control
- decay heat removal and spent fuel pool cooling system operation
- containment closure

The inspectors verified that the licensee:

- considered risk in developing the outage schedule
- controlled plant configuration in accordance with administrative risk reduction methodologies
- developed work schedules to manage fatigue
- developed mitigation strategies for loss of key safety functions
- adhered to operating license and technical specification requirements

Inspectors verified that safety-related and risk-significant SSCs not accessible during power operations were maintained in an operable condition. The inspectors also reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with outage activities. Documents reviewed are listed in the Attachment. This activity constitutes one Refueling and Other Outage Activities sample.

Approximately three weeks (December 9, 2013) into the last operating cycle on Unit 1, a loose parts alarm was received in the lower vessel area. The licensee performed an evaluation of the signal and determined that the mass was approximately 1 lbm and would not pose a significant threat to the unit. Westinghouse was involved in the evaluation and also performed neutron monitoring of the ex-core nuclear instruments to verify that no wedging of the core barrel was occurring.

The evaluation concluded it was safe to operate for the remainder of the cycle.

Subsequent investigation during the outage revealed the loose parts alarm was caused by two spilled reactor vessel specimen capsules.

b. Findings

Introduction: The inspectors identified an unresolved item (URI) associated with the control of specimen capsules inside the reactor vessel.

Description: During this refueling outage, the licensee noted that two specimen capsules had become dislodged from their location on the core barrel. This particular outage required a 10 year ISI inspection and the core barrel was removed as part of the outage plan. The two capsules were noted to have been moved during the last refueling outage. A formal root cause evaluation was performed. The root cause team included industry experts independent of the licensee organization. The root cause team noted several procedural violations during the previous capsule move. The team concluded that these significant errors led to the improper seating of the capsules in the specimen baskets and ultimately allowed the capsules to dislodge from the core barrel. A significant foreign object retrieval evolution was completed during the outage and the core barrel, lower internals, and lower vessel head were inspected by the licensee and the NRC. The specimen parts were collected and placed in storage containers and transferred to the spent fuel pool. The unit was restarted on May 15 without a full accountability of the specimen parts. The inspectors determined that more inspection of this issue is required in order to understand all aspects of the incident. This issue will be tracked as URI 05000327/2015002-02, "Spilled Specimen Capsule."

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

For the seven surveillance tests identified below, the inspectors assessed whether the SSCs involved in these tests satisfied the requirements described in the TS surveillance requirements, the UFSAR, applicable licensee procedures, and whether the tests demonstrated that the SSCs were capable of performing their intended safety functions. This was accomplished by witnessing testing and/or reviewing the test data. Documents reviewed are listed in the Attachment. This activity constitutes seven Surveillance Test samples.

Routine Surveillance Tests:

- 1-SI-OPS-082-026.A, Loss of Offsite Power with Safety Injection, Revision 49
- 0-SI-NUC-000-038.0, Shutdown Margin, Revision 79
- 1-SI-OPS-082-026.B, Loss of Offsite Power with Safety Injection, Revision 47
- 1-SI-OPS-000-009.0, Actuation of ECCS and Boron Injection Flowpath valves via SI signal, Revision 10

Ice Condenser Surveillance Test:

- 0-SI-MIN-061-109.0, Unit 1 Ice Condenser Intermediate/Lower Inlet Doors and Vent Curtains, Revision 6
- 0-SI-MIN-061-001.0, Unit 1 Ice Condenser Loose Debris Evaluation, Revision 4

Containment Isolation Valve (CIV) Surveillance Tests:

- 0-SI-SLT-000-257.0, Type "B" Local Leak Rate Test, Revision 8 (Penetrations X-146E, X-120E, X-131E)

b. Findings

No findings were identified.

## Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on June 25, 2015, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation (PAR) development activities. The inspectors observed emergency response operations in the simulated control room to verify that event classification and notifications were done in accordance with EPIP-1, Emergency Plan Classification Matrix, Revision 51. The inspectors also attended the licensee critique of the drill to compare any inspector observed weakness with those identified by the licensee in order to verify whether the licensee was properly identifying deficiencies. This activity constitutes one Drill Evaluation sample.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security

4OA1 Performance Indicator (PI) Verification (71151)a. Inspection Scope

The inspectors sampled licensee submittals for the three PIs listed below for the period from April, 2014 through March, 2015 for both Unit 1 and Unit 2. Definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Indicator Guideline, Revision 7, were used to determine the reporting basis for each data element in order to verify the accuracy of the PI data reported during that period.

Cornerstone: Initiating Events

- unplanned Scrams per 7000 Critical Hours
- unplanned Scrams with Complications
- unplanned Power Changes per 7000 Critical Hours

The inspectors reviewed selected Licensee Event Reports (LERs) and portions of operator logs to verify whether the licensee had accurately identified the number of scrams and unplanned power changes that occurred during the previous four quarters for both units. The inspectors also reviewed the accuracy of the number of critical hours reported and the licensee's basis for addressing the criteria for complications for each of the reported scrams. Documents reviewed are listed in the Attachment. This activity constitutes six Performance Indicator Verification samples.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Daily Review

a. Inspection Scope

As required by Inspection Procedure (IP) 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This was accomplished by reviewing the description of each new PER and attending daily management review committee meetings.

b. Findings and Observations

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

As required by IP 71152, the inspectors performed a semi-annual review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspector's review was focused on repetitive equipment issues, but also included licensee trending efforts and licensee human performance results. The inspector's review nominally considered the six-month period of January 2015 through June 2015, although some examples expanded beyond those dates when the scope of the trend warranted. Specifically, the inspectors considered the results of daily inspector screening discussed in Section 4OA2.1 and reviewed licensee trend reports for the period in order to determine the existence of any adverse trends that the licensee may not have previously identified. This inspection satisfied one inspection sample for Semi-annual Trend Review.

b. Findings and Observations

No findings were identified. The inspectors did note a negative trend regarding reliability/availability of the site's EDGs. The site has four safety related EDGs, 1A, 1B, 2A, and 2B. In the first half of 2015, there were several significant issues encountered by the inspectors related to the safety-related EDGs. These issues are listed below:

- CR 983193, High Vibration Levels on the motor for EDG 1A2 DC Soak-back Pump, (Jan 30, 2015)
- CR 985817, High Vibration Levels on the motor for EDG 1B1 DC Soak-back Pump, (Feb 6)
- CR 986656, Monitor Vibration Levels on EDG 2A2 Fuel Oil Priming Pump (Feb 9)
- CR 987214, EDG 1A and 2A Cables Not Lugged Per M&AI 7.1 Requirements, (Feb 12)
- CR 1015429, Loss of Control while loading 2A EDG (Apr 20)
- CR 1041370, 2A EDG Emergency Stopped due to Uncontrollable MVARs (Jun 19)
- CR 1033792, Clogging of 1B EDG heat exchanger

The first three condition reports (CR 98193, 985817, and 986656) involve elevated vibration levels associated with motors that support the EDG function. The third condition report (CR 987214) described a condition associated with inadequate crimping of the EDG cabling that was implemented as a result of a Fukushima modification. The licensee noted that the crimping resulted in an operable but degraded condition of the 1A and 2A EDGs. Corrective actions resulted in accumulation of unavailability time on both EDGs to correct the degraded condition. The fourth condition report (CR1015429) was the result of a failure of the electronic governor associated with the 2A EDG. Corrective actions resulted in the accumulation of unavailability time while the electronic governor was replaced. The Root cause analysis on the electronic governor did not identify a failed component; however, the safety function of the 2A EDG was confirmed by providing a simulated under-voltage condition to confirm the EDG would have properly functioned in an emergency condition, minimizing any accumulated unavailability time since the last successful run of the 2A EDG.

The fifth condition report (CR 1041370) described a failure of the 2A EDG during a monthly surveillance run where the voltage regulator failed to maintain a constant reactive power loading. The failure was attributed to an internal wire failure that caused a short within the voltage regulator circuitry. This electrical short then caused a subsequent failure of an electrical amp meter and the voltage overshoot reduction device (VORD). Troubleshooting activities and corrective actions resulted in accumulation of unavailability time and due to parts obsolescence, the 2A EDG was returned to service in an operable but degraded condition with the amp meter and the VORD effectively removed from the voltage regulator circuit under a temporary modification.

The final condition report (CR1033792) is described in Section 1R15 and resulted in a NCV as documented in this report. The inspectors discussed this negative trend with site management.

Although there did not appear to be a common theme, the inspectors concluded that there was an increased unavailability time during this period to address degraded conditions associated with the EDGs.

### .3 Annual Follow-up of Selected Issues

#### a. Inspection Scope

The inspectors conducted a detailed review of the following two condition reports:

- CR 889645, "Equipment apparent cause evaluation (ACE) for Compression Fitting Leak
- CR 789138, ACE for NRC identified NCV for failure to implement procedures for equipment and maintenance control

The inspectors evaluated the following attributes of the licensee's actions:

- complete and accurate identification of the problem in a timely manner
- evaluation and disposition of operability and reportability issues
- consideration of extent of condition, generic implications, common cause, and previous occurrences
- classification and prioritization of the problem
- identification of root and contributing causes of the problem
- identification of any additional condition reports
- completion of corrective actions in a timely manner

Documents reviewed are listed in the attachment. The inspectors completed two condition report annual follow-up samples.

#### b. Findings and Observations

No findings were identified. In general, the inspectors verified that the licensee had proposed or implemented appropriate corrective actions.

### 4OA5 Other Activities

#### .1 Institute of Nuclear Power Operations (INPO) Plant Assessment Report Review

##### a. Inspection Scope

The inspectors reviewed the final report associated with the INPO plant assessment of Sequoyah conducted from October 6 to Oct 21, 2014.

The inspectors reviewed the report to ensure that issues identified were consistent with the NRC perspectives of licensee performance and if any significant safety issues were identified that required further NRC follow-up.

b. Findings

No findings were identified.

.2 Review of the Operation of an Independent Spent Fuel Storage Installation (ISFSI) (60855.1)a. Inspection Scope

On June 30, the inspectors performed a walk-down of the ISFSI storage pad in order to verify that operations were conducted in a safe manner in accordance with approved procedures and without undue risk to the health and safety of the public. The inspectors noted that there were 44 multi-purpose canisters (MPC) positioned on the ISFSI pad. The inspectors verified the MPC vents were in good condition and free of obstruction. The inspectors also verified that appropriate radiation surveys were being performed in the vicinity of the MPCs. The inspectors verified that any ISFSI problems were placed in the CAP. The inspectors also reviewed ISFSI document control practices to verify that changes to the required ISFSI procedures and equipment were performed in accordance with guidelines established in local procedures and 10CFR72.48. Documents reviewed are listed in the Attachment. This activity constitutes one ISFSI Operation Inspection sample.

b. Findings

No findings were identified.

4OA6 Meetings, Including ExitExit Meeting Summary

On June 29, 2015, the inspectors presented the inspection results to Mr. J. Carlin and other members of his staff, who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

4OA7 Licensee-identified Violations

The following violation of very low significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as an NCV.

Unit 1 Technical Specifications Section 3.3.1.1 requires two channels of intermediate range nuclear instrumentation in Mode 2 to provide the input to the P-6 interlock. This interlock allows the operator to block the source range channels during a reactor startup.

This is done to prevent damage to the detectors as power is elevated to levels that could damage the detector. Contrary to the above, between March 11 and March 27, the P6 interlock was inoperable due to a non-conservative bias, concurrent with Unit 1 being in Mode 2 on March 14 from 0558 to 1010.



This problem was entered into the licensee's corrective action program as CR 1005422. The finding was screened using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," and was determined to be of very low safety significance (Green).

ATTACHMENT: SUPPLEMENTARY INFORMATION

## **SUPPLEMENTARY INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee personnel

J. Alfultis, Senior Manager of Projects  
J. Carlin, Site Vice President  
A. Day, Senior Manager of Chemistry  
D. Erb, Director of Work Control  
M. Halter, Senior Manager of Radiation Protection  
E. Henderson, Licensing Manager  
J. Johnson, Program Manager Licensing  
A. Little, Senior Manager of Nuclear Site Safety  
T. Marshall, Director of Nuclear Plant Operations  
W. Pierce, Site Engineering Director  
P. Pratt, Plant Manager  
M. Purcell, Senior Manager of Quality Assurance  
M. Rasmussen, Director of Maintenance  
K. Smith, Director of Training

#### NRC personnel

A. Hon, Project Manager, Office of Nuclear Reactor Regulation

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Opened and Closed

05000328/2015002-01	NCV	Failure to Adequately Follow Foreign Material Control Procedures. (Section 1R15)
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#### Opened

05000327/2015002-02	URI	Spilled Specimen Capsule (Section 1R20)
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## **LIST OF DOCUMENTS REVIEWED**

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

### **Section R04: Equipment Alignment**

#### Procedures

0-SO-74-1, Residual Heat Removal System, Revision 96

#### Drawings

0-47W810-1, Flow Diagram Residual Heat Removal System, Revision 53

1-47W611-74-1, Mechanical Logic Diagram Residual Heat Removal, Revision 7

2-47W611-74-1, Mechanical Logic Diagram Residual Heat Removal, Revision 6

#### Other documents

FSAR Section 5.5.7, Amendment 25

### **Section R05: Fire Protection**

#### Procedures

SQN-FPR-Part-II, SQN Fire Protection Report Part II – Fire Protection Plan, Revision 33

### **Section R08: InService Inspection**

#### Procedures

N-MT-6, Magnetic Particle Examination for ASME and ANSI Code Components and Welds, Revision 0034

N-PT-9, Liquid Penetrant Examination of ASME and ANSI Code Components and Welds, Revision 0037

N-VT-1, Visual Examination Procedure for ASME Section XI Pre-service and Inservice, Revision 0046

#### Calculations

MDQ-001-068-2007-0180, Calculation of EDY for SQN Unit 1 RPV Head, Revision 1

#### Self-Assessments

CRP-ENG-F-13-031, TVA Nuclear Power Group, Fleet Assessment of the BACC Program at Sequoyah and Watts Bar Nuclear Plants Report, 10/28/2013

#### Condition Reports as a result of inspection

SR 1013252, Clean Duct Tape Residue from Upper Head Flange, 4/14/2015

SR 1017085, NRC/Engineering Programs Boric Acid Walkdown, Boric Acid on 1-VLV-062-0585, 4/22/2015

SR 1017091, NRC/Engineering Programs Boric Acid Walkdown, Boric Acid on 1-LG-068-0403, 4/22/2015

SR 1017098, NRC/Engineering Programs Boric Acid Walkdown, Boric Acid on 1-ISIV-068-0404E, 4/22/2015

- SR 1017101, NRC/Engineering Programs Boric Acid Walkdown, Boric Acid on 1-VTIV-068-0414E, 4/22/2015
- SR 1017110, NRC/Engineering Programs Boric Acid Walkdown, Boric Acid on 1-FCV-VLV-063-0098, 4/22/2015
- SR 1017113, NRC/Engineering Programs Boric Acid Walkdown, White Residue in Raceway, 4/22/2015
- SR 1017803, Observation by NRC Inspector on Cleanliness of CRDM Area, 4/23/2015
- SR 1017809, Observation by NRC Inspector on Insulation at CRDM Assemblies, 4/23/2015
- SR 1017867, Observation by NRC Inspector on Exposed Wire, 4/23/2015
- SR 1017877, Observation by NRC Inspector of Damaged Protective Boot on 1-MSH-583, Verify the Functionality of Snubber 1-MSH-503, 4/23/2015
- SR 1017925, Notice of Indication (NOI), 1-SQ-515 for CRDM Seismic Support, 4/23/2015
- SR 1038477, Indication Characterization Questioned by NRC NDE Inspector, Thermal Shield Flexure, 4/23/2015
- SR1018133, NRC Identified Potential Masking of Leaks on Bottom Head Exams during the U1R20 NRC ISI Inspection, 4/24/2015

#### Condition Reports

- PER 940673, OE Review of North Anna Failed Fuel Assembly, 11/24/2014
- PER 954345, OE Reviewed based on Fort Calhoun, PI&R Design Control, 11/6/2014
- PER 969670, 2A SI Pump has Boric Acid Buildup on inboard injection water line, 12/23/2014
- Condition Report Summary 1038477, Indication Characterization Questioned by NRC Inspector, 6/11/2015

#### Procedures

- 54-ISI-135-009, Conventional and Phased Array Ultrasonic Linearity Measurements, Revision 009
- 54-ISI-24-035, Written Practice for Personnel Qualification in Eddy Current Examination, Revision 035
- 54-ISI-419-001, Multi-Frequency Eddy Current Examination of Reactor Vessel Partial Penetration Welds and Nozzles Using a 3x19 Pancake Coil Array Probe, Revision 001
- 54-ISI-460-004, Multi-Frequency Eddy Current Examination of Nozzle Welds and Regions, Revision 04
- 54-ISI-494-004, Multi-Frequency Eddy Current Array Probe Examination of Vent Line and RVLIS Nozzle Bores, Revision 000
- 54-ISI-603-007, Automated Ultrasonic Examination of RPV Closure Head Penetrations Containing Thermal Sleeves, Revision 007
- 54-ISI-604-012, Automated Ultrasonic Examination of Open Tube RPV Closure Head Penetrations, Revision 12
- 54-ISI-824-001, ID Automated Ultrasonic Examination of Small Bore Dissimilar Metal Welds, Revision 001
- 54-UT-901-003, Automated Ultrasonic Examination of Wear in RPV Closure Head Thermal Sleeves, Revision 003

#### Miscellaneous Documents

- Certificate of Calibration for  $\mu$ Tomoscan-08LJ, Serial Number 55556 (AREVA Control Number VH-7969), calibration date: 3/12/2015

Certificate of Calibration for  $\mu$ Tomoscan-08LJ, Serial Number 63592 (AREVA Control Number VH-8168), calibration date: 9/5/2014

Certificate of Calibration for digital thermometer, Serial Number JC34339 (AREVA Control Number VH-10757), calibration date: 3/9/2015

Certificate of Calibration for digital thermometer, Serial Number 45472 (AREVA Control Number VH-11835), calibration date: 3/9/2015

Certificate of Calibration for Eddy Current Instrument, Ectane, Serial Number 1201925 (AREVA Control Number VH-12740), calibration date: 1/16/2015

Certificate of Calibration for Eddy Current Instrument, Serial Number 1225503 (AREVA Control Number VH-13467), calibration date: 1/14/2015

Certificate of Calibration for ZSCAN-UT, Serial Number 520024 (AREVA Control Number VH-11572), calibration date: 1/9/2015

Certificate of Calibration for ZSCAN-UT, Serial Number 568942 (AREVA Control Number VH-12416), calibration date: 3/11/2015

Certificate of Certification, Magnaflux Spotcheck Developer, SKD-S2, 1/16/2013

Certificate of Certification, Magnaflux Spotcheck Penetrant, SKL-SP2, 11/15/2013

Degradation Assessment and Operational Assessment Technical Review and Justification for not Performing Primary or Secondary Inspections of the Steam Generators SQN U1R20 Outage, Revision 0

Examination Summary and Resolution, for Component 1-SIH-242-IA Integral Attachment Weld, 4/20/2015

FS1-0021623, Characterization of Potential Debris Sources and Observed Debris (SEQ1-EOC20), Rev. 1.0

FS1-0021769, T-H Evaluation of Specimen Tube Debris for SEQ1 EOC20, Rev. 1.0

FS1-0021793, Loose Parts Evaluation of Debris at SEQ1-21 Redesign, Rev. 1.0

Inspector Identification Number 9OCDEVZFD, Certificate of Method Qualification, Radiographic Examination (RT), Level III, 11/1/2013

Inspector Identification Number BLC9970, IHI Southwest Technologies INC. Certificate of Qualification for (PT), 1/26/2015

Inspector Identification Number BLC9970, IHI Southwest Technologies INC. Visual Acuity Examination Record for NDE/QC Personnel, 1/5/2015

Inspector Identification Number D8B0WSO0D, Certificate of Method Qualification, Visual Examination VT-3, Level II, 12/16/2014

Inspector Identification Number D8B0WSO0D, Certificate of Method Qualification, Magnetic Particle Examination (MT), Level II, 8/25/2014

Inspector Identification Number D93LIVL1J, Certificate of Method Qualification, Liquid Penetrant, Level II, 7/13/2014

Inspector Identification Number D93LIVL1J, Visual Acuity Examination Record for NDE/QC Personnel, 7/7/2014

Inspector Identification Number O8LSTBZBK, Certificate of Method Qualification, Liquid Penetrant, Level II, 9/8/2014

Inspector Identification Number O8LSTBZBK, Visual Acuity Examination Record for NDE/QC Personnel, 9/5/2014

MMDP-10, Weld Data Sheet, Weld Number 1-CS-31, 5/13/2015

NDE Report Number R0063, Liquid Penetrant Examination for Component ID 1-SIH-102-1A Integral Attachment Weld, 4/19/2015

NDE Report Number R-0069, Liquid Penetrant Examination for Component 1-SIH-242-IA Integral Attachment Weld, 4/20/2015

NDE Report Number R0081, Record of Visual Examination for Component Support ID 1-AFDH-361, 4/22/2015  
 ODMI U1R20, Reactor Cavity Leakage, 4/17/2015  
 OS&F/NPG, Visual Examination of PWR Vessel Interiors and Core Support Structures, Record of Reactor Vessel Examination (EVT1 and VT-3), 4/20/2015  
 Personnel qualifications for D. Black, J. Breza, M. Key, K. Lareau, N. Koscielny, and R. Rose  
 Report of Calibration, Certificate Number 109446, Asset ID E52622, 6/23/2014  
 Report of Calibration, Certificate Number 96014, Asset ID 522355, 6/23/2014  
 Safety Evaluation by USNRC-NRR, Requests for Alternatives 13-ISI-1 and 13-ISI-2 to extend the Reactor Vessel Weld Inservice Inspection Interval Sequoyah Nuclear Plant, Units 1 and 2 Docket Numbers 50-327 and -328, 8/1/2014  
 Sequoyah Unit 1 Cycle 18, Reactor Pressure Vessel Closure Head Visual (VT-2) Penetration Examination, Final Report March 2012  
 Specimen Capsule Safety Evaluation, dated May 12, 2015  
 Sequoyah Unit 1 FOSAR to Support Failed Irradiated Specimen Capsule Recovery Sequoyah TVA-15-49, Tennessee Valley Authority Sequoyah Nuclear Plant Unit 1 Failed Irradiation U1R20 Outage, dated May 01, 2015 Weld Number 1-CS-31, Final Radiograph Examination Report, 4/30/2015  
 Welder/Welding Operator Performance Qualification Record, ID Number J917A29Y8, 4/6/2015

### **Section R11: Licensed Operator Requalification**

#### Other documents

LOR - SEG #S-88, Main generator trip with a loss of secondary heat sink, Rev 1

### **Section R12: Maintenance Effectiveness**

#### Procedures

TI-4, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting – 10CFR50.65, Revision 27

#### Other documents

CDE 2816 – Maintenance rule functional failure of the 'A' main control room air handler unit  
 CDE 2819 – Shut down board room chiller failure

### **Section R13: Maintenance Risk Assessments and Emergent Work Evaluation**

#### Procedures

NPG-SPP-07.1, "On-Line Work Management," Revision 16  
 NPG-SPP-09.11.1, Equipment Out of Service Management, Rev 10  
 NPG-SPP-07.3, Work Activity Risk Management Process, Revision 16  
 NPG-SPP-07.2.4, Forced Outage or Short Duration Planned Outage Management, Revision 5  
 NPG-SPP-07.2, Outage Management, Revision 5  
 GOI-6, Apparatus Operations, Revision 171

## **Section R15: Operability Evaluations**

### Procedures

NEDP-22, Functional Evaluations, Rev. 15

OPDP-8, Limiting Conditions for Operation Tracking, Rev. 18

NPG-SPP-03.5, Regulatory Reporting Requirements, Revision 11

### Condition Reports

CR 922169 ODMI U1R20 Reactor Cavity Leakage

CR 1004562, Intermediate Range N-35 and N-36 incorrect setpoints

CR 992513, Gas vented during performance of (emergency core cooling system) ECCS piping vents

CR 1024123, 1B-B DG frequency outside administrative limit

CR 1033792, Wood fragments discovered in 2B1/2B2 Diesel Heat Exchangers

## **Section R18: Plant Modifications**

### Procedures

NPG-SPP-09.3, Plant Modifications and Engineering Change Control, Revision 18

NPG-SPP-09.4, 10 CFR 50.59 Evaluations of Changes, Tests, and Experiments, Revision 9

NPG-SPP-09.5, Temporary Modifications, Revision 9

### Other documents

SQN-0-2015-250-001, Provide Temp power from 1-S Charger to 125 vital boards III and IV

SQN-0-2015-082-001, functionally disabling VORD and direct current (DC) amp meter on 2A EDG

## **Section R19: Post Maintenance Testing**

### Work Orders

116740563, Replace the 2A-A EDG electric governor controller (2301A)

115144061, Implement DCN 23216, Stage 8. Remove the auto function from 2-HS-3-128C-B

116109358, Perform 0-MI-EPM-317-040.0 for the arrowhead contactor

116256562, Preventive maintenance for Train B RVLIS transmitter's panel isolation valves

115622809, Determinate/reterminate the cooler fan motor to facilitate coil replacement on WO 114850708

## **Section R20: Refueling and Outage Activities**

### Procedures

0-GO-1, Unit Startup from Cold Shutdown to Hot Standby, Revision 77

0-GO-2, Unit Startup from Hot Standby to Reactor Critical, Revision 41

0-GO-3, Power Ascension from Reactor Critical to Less Than 5 Percent Power, Revision 27

0-GO-4, Power Ascension from Less Than 5 % Power to 30% Reactor Power, Revision 89

0-GO-6, Power Reduction from 30% Reactor Power to Hot Standby, Revision 56

0-GO-7, Unit Shutdown from Hot Standby to Cold Shutdown, Revision 77

0-GO-15, Containment Closure Control, Revision 38

**Section R22: Surveillance Testing**Procedures

1-SI-OPS-082-026.A, Loss of Offsite Power with Safety Injection, Revision 49  
 0-SI-MIN-061-109.0, Unit 1 Ice Condenser Intermediate/Lower Inlet Doors and Vent Curtains, Revision 6  
 0-SI-MIN-061-001.0, Unit 1 Ice Condenser Loose Debris Evaluation, Revision 4  
 0-SI-MIN-061-105.0, Unit 1 Ice Condenser Ice Weighing, Revision 11  
 0-SI-MIN-061-106.0, Unit 1 Ice Condenser Flow Passage Inspection, Revision 7  
 0-SI-MIN-061-107.0, Unit 1 Ice Condenser Floor Drains, Revision 3  
 1-SI-OPS-082-026.B, Loss of Offsite Power with Safety Injection, Revision 47

**Section 40A2: Problem Identification and Resolution**Procedures

NPG-SPP-22.300, "Corrective Action Program," Revision 3  
 NPG-SPP-09.17, Temporary Equipment Control, Revision 6  
 0-TI-DXX-000-013.0, Temporary Equipment Control, Revision 9  
 MMTP-102, Erection of Scaffolds/Temporary Work Platforms and Ladders, Revision 11

CRs

CR 983193, High Vibration Levels on the motor for EDG 1A2 DC Soak-back Pump, (Jan 30, 2015)  
 CR 985817, High Vibration Levels on the motor for EDG 1B1 DC Soak-back Pump, (Feb 6)  
 CR 986656, Monitor Vibration Levels on EDG 2A2 Fuel Oil Priming Pump (Feb 9)  
 CR 987214, EDG 1A and 2A Cables Not Lugged Per M&AI 7.1 Requirements, (Feb 12)  
 CR 1015429, Loss of Control while loading 2A EDG (Apr 20)  
 CR 1041370, 2A EDG Emergency Stopped due to Uncontrollable MVARs (Jun 19)  
 CR 1033792, Clogging of 1B EDG heat exchanger



## LIST OF ACRONYMS

ACE	Apparent Cause Evaluation
AFW	Auxiliary Feedwater
ASME	American Society of Mechanical Engineers
BACC	Boric Acid Corrosion Control
BAE	Boric Acid Evaluation
CAP	Corrective Action Program
CDE	Cause Determination Evaluation
CR	Condition Report
CRDM	Control Rod Drive Mechanism
DC	Direct Current
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EDY	Effective Degradation Years
EPIP	Emergency Plan Implementing Procedure
EOL	End-of-Life
ERCW	Essential Raw Cooling Water
F	Fahrenheit
FME	Foreign Material Exclusion
FOSAR	Foreign Object Search and Retrieval
GL	Generic Letter
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
ISI	Inservice Inspection
ISFSI	Independent Spent Fuel Storage Installations
LCO	Limiting Condition for Operation
LER	Licensee Event Report
MPC	Multi-purpose Containers
MT	Magnetic Particle Test
NCV	Non-cited Violation
NDE	Non-destructive Examination
NEI	Nuclear Energy Institute
PARs	Protective Action Recommendations
PERs	Problem Evaluation Reports
PI	Performance Indicator
PM	Preventive Maintenance
PT	Penetrant Test
RTP	Rated Thermal Power
RVCH	Reactor Vessel Closure Head
SDP	Significance Determination Process
SRs	Service Requests
SSCs	Structure, System, or Components
TS	Technical Specification
TVA	Tennessee Valley Authority
URI	Unresolved Item

UFSAR	Updated Final Safety Analysis Report
UTs	Ultrasonic Examinations
VORD	Voltage Overshoot Reduction Device
VT	Visual Examination
WO	Work Order